REMARKS/ ARGUMENTS

Claims 14 to 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over USP T644006 to Couling or USP 6467527 to Kubota et al.

Reconsideration of the application based on the following remarks is respectfully requested.

Rejections under 35 U.S.C. 103(a)

Claims 14 to 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over USP T644006 to Couling or USP 6467527 to Kubota et al.

Couling discloses a magnesium base alloy suitable for use in high pressure die casting containing by weight from about 0.2 to about 3 percent aluminum, greater than 1.5 up to about 2 percent silicon and optionally up to about 2 percent manganese and up to about 1 percent zinc.

Kubota et al. discloses a method for die-casting a magnesium alloy comprises the step of casting a die cast product free of any hot tearing, shrinkage tearing and shrinkage cavity starting from a magnesium alloy comprising i) 1 to 10% by weight of aluminum; ii) at least one member selected from the group consisting of 0.2 to 5% by weight of a rare earth metal, 0.02 to 5% by weight of calcium and 0.2 to 10% by weight of silicon; and iii) not more than 1.5% by weight of manganese, and the balance of magnesium and inevitable impurities, using a cold chamber type die-casting machine. (Abstract).

Claim 14, as amended recites a water quenched die casting alloy, comprising:

Mg base;

Al between 2.8 and 3% by weight;

Si between 0.7, and 1.5 % by weight;

Mn greater than 0.20 % by weight;

Zn less than 0.20 % by weight;

Cu less than 100 ppm;

Ni less than 20 ppm; and

Fe less than 50 ppm.

It is respectfully submitted that neither Couling nor Kubota et al. discloses a water quenched magnesium/aluminum die casting alloy. It is respectfully submitted that, contrary to the assertion on page 3 of the Office Action, Kubota et al. does not disclose an alloy that is water quenched and does not in any way discuss water quenching. The process of injecting a molten magnesium alloy having a temperature of 650 to 750 degrees C in a cold mold having a temperature of 150 to 350 degrees C as disclosed in Kubota et al. is in no way water quenching, but is simply the process of cold chamber type die-casting. Water quenching, as known to one of ordinary skill in the art, is a distinct process from simply die-casting and requires immersion of heated metal into water to cool the heated metal. Neither references discloses an alloy that was water quenched or any immersion into water.

Furthermore, "water quenched," as recited in claim 14, limits the device as recited in claim 14 because one of skill in the art would clearly understand that a water quenched alloy is physically different from the alloys disclosed in Couling or Kubota et al. One of skill in the art would understand that water quenching can only successfully be performed within certain range of parameters and that any water quenching within this range would produce an alloy that is structurally distinct from the same alloy cooled in another manner. A water quenched magnesium/aluminum die casting alloy as claimed has distinctive structural characteristics compared to similar alloys that are not water quenched. (MPEP 2113). Such characteristics are discussed in the present application, for example, at paragraphs [0013] and [0014]. It is respectfully submitted that, contrary to the assertion of the Examiner at page 5 of the Final Office Action, the separation of aluminum not dissolved in the Mg matrix in the form very fine $Mg_{17}Al_{12}$ phases is a definite structure/property.

Additionally, the documents presented in the Declaration pursuant to 37 C.F.R. § 1.132 with the Response to Office dated July 15, 2008 provide further support that water quenching imparts distinctive structural characteristics to the alloy recited in claim 14. The microstructures of magnesium-based alloy gear boxes formed using the conventional method of air cooling are shown on page 6 of the "Mg-Application in the 7G-Tronic-Gear" before and after 2000 hours of thermal aging and the microstructures of magnesium-based alloy gear boxes formed by water quenching according to the present invention are shown on page 7 of the "Mg-Application in the

7G-Tronic-Gear" before and after 2000 hours of thermal aging. (See also "Proceedings: 61st Annual World Magnesium Conference," pages 82, 83). The water quenched magnesium-based alloy gear boxes include fine $Mg_{17}Al_{12}$ phases after 2000 hours of thermal aging while the air cooled magnesium-based alloy gear boxes include coarse $Mg_{17}Al_{12}$ phases after 2000 hours of thermal aging. Additionally, it is apparent from the pictures on pages 6 and 7 of the "Mg-Application in the 7G-Tronic-Gear," that distinctive structural differences exist between the water quenched magnesium-based alloy and the air cooled magnesium-based alloy before the thermal aging. It is also respectfully submitted that the $Mg_{17}Al_{12}$ phase differences after thermal aging conclusively show that the water quenched magnesium-based alloy and the air cooled magnesium-based alloy have structural differences before thermal aging. If no structural differences existed before the thermal aging, the structures would respond to the thermal aging in the same manner. Thus, the water quenching imparted distinctive structural characteristics to the magnesium-based alloy gear boxes.

It is respectfully submitted that it would not have been obvious to one of ordinary skill in the art to have water quenched the magnesium based alloys of Couling or Kubota et al., because handling hot magnesium, especially magnesium melts near water, is highly risky. Because magnesium is highly inflammable when hot or melted, one of skill in the art would have been led, at the time of the present invention, away from water quenching a magnesium based alloy.

It is also respectfully submitted that neither Couling nor Kubota et al. discloses "Zn less than 0.20 % by weight; Cu less than 100 ppm; Ni less than 20 ppm; and Fe less than 50 ppm," as recited in claim 1. Kubota et al. discloses a balance of inevitable impurities (Abstract), but there is no indication that alloys disclosed in Kubota et al. include Zn, Cu, Ni and Fe below the levels recited in claim 1. Also, there is no indication that the alloy in Couling includes Zn, Cu, Ni and Fe below the levels recited in claim 1.

Withdrawal of the rejections under 35 U.S.C. 103(a) to claims 14 to 19 is respectfully requested.

CONCLUSION

The present application is respectfully submitted as being in condition for allowance and applicants respectfully request such action.

Respectfully submitted,

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